REMARKS

Claims 1-5 are presented for reexamination.

The claims are amended to make it clear that the invention relates to a reluctance resolver wherein angular position is determined by detection of the reluctance or permeance between a rotor pole and a stator pole.

Claims 1, 4 and 5 have been rejected under 25 U.S.C. §102(b) as being anticipated by U.S. Patent 2,805,677 (Baird) or 6,433,536 (Yundt et al.) and claims 2 and 3 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Yundt et al. However neither Baird nor Yundt et al. disclose any reluctance resolver wherein angular position is determined by the permeance between a rotor pole and a stator pole. Thus neither Baird nor Yundt et al. can possibly be said to teach a rotor shape which results in substantially less error when detecting angular position by measuring permeance between a rotor pole and a stator pole.

The quantity of magnetic flux produced by a magnetic potential source (electric coil or permanent magnet) in a magnetic circuit varies proportionally with the permeance of the magnetic circuit or varies inversely with the reluctance of the magnetic circuit. In a typical reluctance resolver, the measurement of a high frequency AC current through coils on the poles of the stator indicates the reluctance or permeance of the gaps between stator poles and salient rotor poles. The present invention concerns a rotor shape which upon detection of the low frequency variation in coil current results in a highly accurate sine wave corresponding to the rotational angle of the rotor. There is no teaching in the prior art that a non-permanent

magnetic rotor having as a shape similar to rotors of Baird or Yundt et al. would result in rotor-pole-to-stator-pole permeance which varies sinusoidally with improved accuracy according to the rotational angle of the rotor in a reluctance resolver.

Baird discloses a detector for determining mis-alignment of a rotating body. Movement of rotor poles past stator poles energized with DC current generates an AC component in each stator winding due to the change in permeance as the rotor pole passes the stator pole. By connecting stator windings on opposite sides of the stator in opposition, the AC components cancel if the rotor is properly aligned but do not cancel if the rotor is eccentrically aligned relative to the stator. By detecting the side producing the strongest AC signal and employing pluralities of opposed stator poles, the direction of eccentricity can be determined. However Baird cannot determine any angular position of the rotor. It is clear error for the office action to reject applicants claims for a reluctance resolver based upon a reference which cannot determine any angular position by detecting permeance between a rotor pole and a stator pole. Although the shape of the rotor of Baird may be similar to the claimed rotor shape, Baird is absent any teaching or suggestion that this rotor shape could result in greatly improved accuracy in measuring angular position of the rotor in a reluctance resolver. Thus applicants' claims are clearly novel and patentable over Baird.

Yundt et al. disclose an apparatus for determining the angular position of a rotor. The rotor has permanent magnet poles and the rotary position of the rotor is determined by magnetic field sensors (Hall effect type sensors) positioned around the rotor. Yundt et al. do

not disclose any stator as recited in applicants' claims; a stator in a reluctance resolver includes a non-permanent magnetic ring with inward projecting poles having coils wound thereon. The Yundt et al. alternating permanent magnet poles on a rotor operate in a completely different manner by determining angular position based upon the variation in strength and direction of the magnetic flux field extending from the permanent magnets. Accordingly the teaching of Yundt et al. concerning the shape of the permanent magnetic poles is not applicable to a reluctance resolver. Yundt et al. contain no teaching or suggestion that the shape of the permanent magnetic poles in Yundt et al. would produce a highly accurate sinusoidal variation in permeance if employed in non-permanent magnetic poles in a reluctance resolver. Thus the rejections of the claims based upon Yundt et al. are untenable and must be withdrawn.

The application as now amended is believed to be in condition for allowance and such favorable action is requested.

Respectfully submitted,

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